METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR JUNE 1943

[Climate and Crop Weather Division, J. B. KINCER, in charge]

AEROLOGICAL OBSERVATIONS

NOTICE.—Effective with the December 1942 issue, the publication of table 1 (RAOB summaries) was discontinued indefinitely.—EDITOR.

TABLE 2.—*Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during June 1943. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second*

Altitude (meters) m. s. l.	Abilene, Tex. (538 m.)			Albuquerque, N.Mex. (1,630 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (512 m.)			Boise, Idaho (870 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (132 m.)			Charleston, S. C. (17 m.)			Cincinnati, Ohio (152 m.)			Denver, Colo. 1,627 m.)			El Paso, Tex. (1,196 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	30	156	3.9	30	191	2.2	28	8	0.4	30	24	2.4	29	264	0.5	30	316	4.4	30	132	7.7	30	234	3.5	30	283	1.8	29	165	2.2	30	224	1.3	30	94	0.8	30	231	2.2
500							28	347	0.4										30	143	8.7	30	254	6.3	30	272	3.7	29	185	5.3	30	263	2.9						
1,000	30	169	5.2				28	241	0.4				29	229	0.8	30	317	4.2	25	152	6.3	28	253	7.8	28	277	6.4	28	198	3.4	30	265	3.9						
1,500	29	170	5.6				28	284	1.3	30	15	2.6	27	228	1.4	30	314	3.3	23	154	5.0	26	260	8.3	25	284	8.8	27	218	2.0	29	265	4.7				30	218	2.0
2,000	28	179	5.4	30	220	3.2	27	304	0.8	29	317	0.3	23	250	2.5	30	283	1.8	22	139	4.3	24	267	9.9	22	287	11.8	24	280	2.0	26	272	4.4	30	115	1.0	30	224	2.4
2,500	23	197	5.2	30	214	3.5	25	278	1.8	26	214	2.4	20	252	5.6	29	244	2.4	22	139	3.7	23	274	10.0	19	291	14.2	23	313	1.4	25	275	4.8	30	147	0.9	30	227	2.9
3,000	19	210	5.2	30	220	3.4	24	256	1.5	22	227	6.3	19	255	8.4	27	224	4.0	19	148	3.6	19	284	11.5	18	298	15.4	23	338	1.5	23	274	4.9	30	200	2.1	30	232	2.8
4,000	19	238	5.2	26	243	5.5	22	253	1.6	18	239	11.7	13	253	13.5	24	228	7.3	18	147	3.4							21	40	0.4	16	286	5.2	25	236	7.2	28	224	3.7
5,000	15	234	5.0	25	248	8.6	17	245	2.1	16	240	13.7	10	250	14.7	24	222	10.9	15	165	2.5							18	334	2.0	11	281	4.6	22	242	13.0	26	231	5.5
6,000	15	226	5.6	23	243	9.1	13	256	3.4	14	252	16.4	10	256	16.2	22	224	13.8	15	158	3.2							15	23	2.0				16	250	14.5	19	235	6.9
8,000	11	231	6.2	17	249	14.5	10	211	6.2	10	246	22.8				17	232	18.8	15	174	2.9													11	260	20.0	19	254	7.6
10,000				13	247	19.3										13	243	21.2	12	115	3.6																10	241	12.3
12,000																			11	110	2.2																	
14,000																			10	102	5.1																	

Altitude (meters) M. s. l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,413 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m)			Las Vegas, Nev. (573 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (410 m.)			Miami, Fla. (15 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (194 m.)			New York, N. Y. (15 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	29	210	5.4	29	268	1.2	27	194	1.6	27	256	0.4	29	126	3.8	29	227	2.7	30	210	4.2	30	191	1.5	30	317	1.6	29	115	4.0	30	169	2.4	30	307	1.2	29	229	3.2
500							27	206	2.3				29	142	4.6	29	232	4.0				30	196	2.7	30	318	2.0	29	123	5.6	30	181	4.1	30	298	2.7	29	252	4.5
1,000							26	225	2.7	27	270	1.4	28	176	3.0	29	236	5.2	30	206	5.8	30	209	2.6	30	317	2.2	29	116	4.6	27	197	2.8	30	285	3.0	27	273	6.2
1,500				29	274	2.2	26	225	2.5	26	230	1.7	26	190	1.9	26	240	5.6	30	214	6.2	29	218	3.0	29	301	2.5	29	101	3.6	25	167	0.3	30	261	3.0	26	286	7.2
2,000	29	207	7.2	29	261	3.1	24	271	3.5	24	233	4.0	26	187	1.6	21	252	6.6	30	220	6.2	27	228	3.3	26	277	2.4	27	92	3.2	24	122	0.2	28	250	4.9	21	294	8.7
2,500	29	199	6.7	29	230	4.1	24	288	4.8	21	249	6.4	25	172	1.5	17	264	6.5	30	215	6.5	24	238	3.6	24	247	2.5	25	101	3.0	21	82	1.0	26	250	5.9	19	294	10.4
3,000	27	209	7.3	28	227	6.0	23	286	4.9	17	245	8.3	24	134	0.8	15	268	7.6	30	217	8.1	23	245	3.6	22	231	2.9	23	115	3.0	19	82	1.8	26	250	6.1	16	292	10.6
4,000	23	217	6.7	23	224	9.0	21	291	5.2				22	101	1.9				30	225	11.4	19	272	3.7	19	285	2.5	19	102	2.7	15	118	3.1	21	262	5.3			
5,000	19	214	12.8	15	232	10.4	19	295	5.0				16	72	3.4				27	230	14.8	13	274	4.4	16	310	5.1	19	70	3.6	10	118	3.3	18	265	5.0			
6,000	15	227	17.9	11	239	13.4	16	290	5.5				15	76	4.3				24	233	17.1	10	257	4.1	16	305	5.2	18	64	3.9				15	259	6.8			
8,000	15	225	22.4				15	296	4.3				11	30	3.4				23	233	19.6				13	302	7.3	14	44	5.4				13	262	9.7			
10,000	13	221	28.1				12	324	5.6										21	234	27.4				10	299	8.8	10	48	7.4									
12,000	11	220	33.4																14	236	25.8																		

Altitude (meters) m.s.l.	Oakland, Calif. (8. m.)			Oklahoma City, Okla. (402 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (388 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Paul, Minn. (225 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (15 m.)			Sault Ste. Marie, (230 m.)			Seattle, Wash. (12 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	29	261	6.5	30	174	5.9	29	182	2.6	30	269	2.2	28	153	1.7	29	208	1.5	30	230	2.1	29	129	3.6	30	269	4.0	28	283	2.8	30	262	2.6	30	253	2.0	30	219	2.8
500	29	276	4.9	30	174	6.5	29	178	4.1	30	270	3.6				29	228	3.0	30	232	2.8	29	139	4.9	30	275	2.9	28	284	4.2	30	281	1.5				30	222	3.6
1,000	27	292	2.3	30	174	6.9	28	190	4.9	30	264	3.8	28	152	1.7	28	246	3.9	27	237	4.4	29	140	5.1	25	264	1.7	26	274	5.4	25	274	1.3	30	233	3.0	28	249	3.7
1,500	25	287	2.0	30	183	6.9	26	210	5.8	30	243	3.8	28	169	1.3	28	260	4.7	22	243	5.9	29	150	4.8	24	265	1.9	24	275	6.1	24	290	1.0	28	225	3.0	26	276	5.5
2,000	22	266	1.4	27	205	6.5	22	234	7.2	30	229	4.4	27	198	2.2	25	268	6.7	21	265	6.8	25	162	3.8	23	243	4.1	20	282	8.0	22	263	0.8	27	232	2.8	24	287	7.2
2,500	22	240	2.1	25	216	7.0	20	244	7.5	30	226	6.1	21	236	4.9	19	259	6.4	19	265	8.5	24	170	2.9	23	241	6.2	18	291	9.9	21	223	1.2	21	244	3.9	20	266	8.9
3,000	22	260	3.2	22	229	5.3	19	250	7.3	30	224	7.3	19	252	6.7	19	257	7.6	13	266	9.5	23	165	3.3	20	230	8.4	15	291	13.4	19	230	2.2	19	244	4.6	19	291	9.1
4,000	21	260	6.4	19	243	4.1	17	271	8.8	30	224	9.6	15	247	9.8	15	254	8.5				20	152	3.3	19	226	10.0	11	294	14.3	16	284	3.2	13	238	2.8	15	291	8.3
5,000	21	256	9.5	19	262	3.5	14	271	9.0	28	221	11.1	13	242	14.2	11	265	5.4				18	155	3.1	13	226	9.5	10	297	15.1	13	294	3.2				13	289	9.4
6,000	20	252	11.2	17	251	4.1	13	262	11.7	27	226	12.0	12	241	13.9							16	160	4.1							10	310	5.9						
8,000	18	239	17.9	12	221	5.6	10	266	16.2	22	238	13.4										12	156	4.3															
10,000				11	218	8.7				20	244	15.1																											
12,000										14	240	17.3																											
14,000										10	242	13.0																											

TABLE 3.—*Maximum free-air wind velocities (m. p. s.), for different sections of the United States, based on pilot-balloon observations during June 1943*

Section	Surface to 2,500 meters (m. s. l.)					Between 2,500 and 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast [1]	38. 9	wnw.	2, 280	5	Portland, Maine	46. 0	wnw.	5, 000	6	Caribou, Maine	64. 0	nnw.	8, 790	14	Caribou, Maine.
East-Central [2]	31. 1	w.	2, 420	12	Huntington, W. Va.	30. 2	w.	5, 000	30	Washington, D. C.	31. 0	w.	7, 550	30	Huntington, W. Va.
Southeast [3]	24. 0	ssw.	2, 090	27	Charleston, S. C.	20. 8	wnw.	4, 660	9	Spartanburg, S. C.	26. 4	n.	10, 180	29	Key West, Fla.
North-Central [4]	37. 9	wsw.	1, 950	1	Detroit, Mich.	44. 0	w.	4, 900	4	Sault Ste. Marie, Mich.	69. 0	wnw.	11, 810	29	Bismark, N. Dak.
Central [5]	32. 4	sw.	1, 230	1	Wichita, Kans.	38. 5	wsw.	5, 000	1	Omaha, Nebr.	60. 0	sw.	6, 180	3	Sioux City, Iowa.
South-Central [6]	28. 2	wsw.	1, 520	2	Amarillo, Tex.	32. 8	sw.	4, 970	2	Amarillo, Tex.	36. 0	wsw.	9, 020	3	Amarillo, Tex.
Northwest [7]	38. 2	nw.	1, 740	7	Great Falls, Mont.	35. 0	sw.	4, 780	23	Billings, Mont.	68. 0	sw.	8, 740	25	Billings, Mont.
											68. 0	ssw.	9, 640	24	Burns, Oreg.
West-Central [8]	42. 6	sw.	2, 240	22	Casper, Wyo.	56. 2	ssw.	3, 800	21	Ely, Nev.	75. 0	nw.	9, 780	2	Reading, Calif.
Southwest [9]	28. 7	ssw.	1, 910	12	Roswell, N. Mex.	49. 5	wsw.	4, 200	2	Raton, N. Mex.	68. 0	w.	5, 320	3	Albuquerque, N. Mex.

[1] Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and Northern Ohio.
[2] Delaware, Maryland, Virginia, West Virginia, Southern Ohio, Kentucky, Eastern Tennessee, and North Carolina.
[3] South Carolina, Georgia, Florida, and Alabama.
[4] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[5] Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.
[6] Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and Western Tennessee.
[7] Montana, Idaho, Washington, and Oregon.
[8] Wyoming, Colorado, Utah, Northern Nevada, and Northern California.
[9] Southern California, Southern Nevada, Arizona, New Mexico, and extreme West Texas.

RIVER STAGES AND FLOODS

By BENNETT SWENSON

Following a month of excessive precipitation and disastrous flooding in the interior of the country in May, the area of above-normal precipitation during June shifted slightly northward and westward. All States from the Rocky Mountains westward, except Arizona, had above-normal amounts, Utah having nearly four times the normal. East of the Rockies, most States north of the 36° latitude had above normal; the exceptions were Indiana, the upper Ohio Valley, the northern Appalachian Region and portions of the Middle Atlantic States.

Excessive flooding occurred in northeast Texas, Kansas, Nebraska, Montana, Minnesota, Iowa, Missouri, Wisconsin, and northern New England. On the other hand, river stages during June were generally considerably below normal in the southern tier of States from Arizona to Florida, except in the lower Mississippi River.

Atlantic Slope drainage.—Heavy rains on June 15–16 caused destructive floods in the upper Connecticut River Basin, and in the headwaters of the Androscoggin and Kennebec Rivers in Maine. The rainfall was in the form of heavy thundershowers which occurred almost entirely within a 24-hour period. In the Connecticut Basin above North Stratford, N. H., the rainfall ranged from 1 to nearly 5 inches. The Connecticut River reached a stage of 14.65 feet at North Stratford on the night of the 16th, exceeding the previous high stage of record, 14.6 feet in March 1936. Flood stage was not exceeded downstream from that point.

Heavy rains on June 1–2 over the upper Susquehanna River Basin caused slight overflows in the Chenango River at Sherburne, N. Y., and in the Susquehanna River at Oneonta, N. Y.

Light to moderate flooding in the Neuse River at Smithfield and Goldsboro, N. C., on June 9–16 resulted from heavy showers and thunderstorms on June 8–9. In the middle portion of the Neuse Basin the precipitation ranged from 1.25 to more than 4.5 inches.

Upper Mississippi Basin.—Abnormally heavy rainfall during May continued into June in most of the upper Mississippi River watershed and caused high stages with flooding generally in the tributaries and the main river during June. The Minnesota River, the Chippewa, Black, and Wisconsin Rivers in Wisconsin, the Raccoon and Des Moines Rivers in Iowa, and the Salt and Meramec Rivers in Missouri were the principal tributaries in flood. The Illinois River, which was in record flood in May continued above flood stage through most of June, and at Beardstown, Ill., the river did not recede to bankful until July 2.

The main Mississippi River was in moderate to severe flood from the headwaters to the mouth of the Ohio River. At St. Louis, the Missouri River flood waters combined with the high water in the Mississippi River to produce a crest of 35.2 feet at St. Louis on June 26, only 3.7 feet below the high flood crest of May 24.

The following report of the June flood in the headwaters of the Mississippi watershed above Hastings, Minn., is submitted by the official in charge, Weather Bureau office, Minneapolis, Minn.:

Abnormally heavy rainfalls throughout the month of May continued during June over this basin and as a result the river was in flood for an unusually long period of time. The average rainfall for May, as determined from 18 stations in the headwaters basin, was 5.12 inches, or 2.13 inches above normal. For the month of June the average rainfall was 6.21 inches or 2.15 inches above normal. The run-off of the Rum River and the Mississippi River at Anoka, Minn., a few miles above Minneapolis, exceeded any June of record. However, the flood stage was not reached at Minneapolis, but was almost attained at St. Paul. The Minnesota River contributed a high discharge into the Mississippi River above the St. Paul gage as the United States Geological Survey records reveal that the peak discharge of the Minnesota River at Carver, Minn., was close to the maximum record of 23,000 c. f. s.

Cautionary river forecasts were issued on June 4 for the Twin Cities and on June 15 for the Mississippi River from Little Falls to Hastings Dam and for the Minnesota River from New Ulm to Mendota, Minn. Damage was mainly agricultural because the lowlands along the streams were inundated. Early seeded crops were destroyed, pasture lands were reduced and damaged, and much difficulty was experienced in the care of livestock and poultry. The total losses, practically all to prospective crops, has been placed at $100,000. Savings as a result of the advisory warnings and daily advices to inquirers is placed at $25,000.

Missouri Basin.—Heavy rains occurred over most of Montana on June 2–3, and over the north central portion about the middle of the month. Largely as a result of the latter rains, floods occurred in the Marias, Teton, Musselshell, portions of the Yellowstone, and in the Missouri